

Permutation

or

Combination?



Key

Yum!

In Exercises 1–8, tell whether the situation is a combination or permutation.

1. How many different 4-letter passwords can be formed using the letters A, B, C, D, E, and F? ${}_6P_4 = 360$
2. A music club offers a choice of 5 CDs from a list of 40. In how many different ways can a member choose 5 CDs? ${}_{40}C_5 = 658,008$
3. There are 13 players on a little league baseball team. How many 9-player batting orders can the coach make for a game? ${}_{13}P_9 = 259,459,200$
4. Eight bands have volunteered to play at a benefit concert. How many ways can the bands be scheduled to play? ${}_8P_8 = 8! = 40,320$
5. From a reading list of 20 books, you must choose 4 books to read during summer vacation. How many book collections can you choose? ${}_{20}C_4 = 4,845$
6. One hundred students buy raffle tickets at the school fair. Three winning tickets, each worth \$20 at the school store are drawn. How many different ways can the prizes be awarded? ${}_{100}C_3 = 161,700$
7. How many different 5-card hands can be dealt from a standard deck of 52 cards? ${}_{52}C_5 = 2,598,960$
8. The call signs for radio stations begin with K or W, followed by 3 letters. How many different call signs can be formed?

$$\frac{2}{KW} \cdot \frac{26}{L} \cdot \frac{26}{L} \cdot \frac{26}{L}$$

35,152

FCP

9. At Milton's Pizza restaurant you can choose from the following toppings: pepperoni, sausage, ham, mushrooms and pineapple. Each pizza can have 3 toppings. How many different pizzas can be made?

$${}^5C_3 = \frac{5 \cdot 4 \cdot 3}{3 \cdot 2 \cdot 1} = 10 \text{ pizzas}$$

10. Jay, Daniel, Will, Ben and Taylor are in a race. How many different ways are there that they can finish?

$${}^5P_5 = 5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120 \text{ ways}$$

11. Hailey, Abby, and Ashleigh are riding in an airplane on their way to Hawaii (lucky ducks!) How many ways can they be seated in a row of 3 seats? List all the possible ways they can be seated.

$${}^3P_3 = 3! = 3 \cdot 2 \cdot 1 = 6$$

H	Ab	Ash	Ab	H	Ash
H	Ash	Ab	Ab	Ash	H
Ash	H	Ab			
Ash	Ab	H			

12. In how many ways can you choose a committee of 3 people from six people?

$${}^6C_3 = \frac{6 \cdot 5 \cdot 4}{3 \cdot 2 \cdot 1} = 20 \text{ ways}$$

13. How many different five-digit zip codes can be formed if no digit can be repeated?

$$10 \cdot 9 \cdot 8 \cdot 7 \cdot 6$$

10P5 # digits used
 ↑
 10 digits - 0 → 9

30,240 zip codes